Interreg

NEXT Black Sea Basin

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EOL

Environmental and Ocean Literacy in the Black Sea Basin Project

The White Paper

YUVA

Protection of Nature

HELLENIC SOCIETY FOR THE PROTECTION OF NATURE

ЗЕЛЕНИ БАЛКАНИ

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CONTENTS

Executive Summery 1

1. INTRODUCTION 2

- Importance of the Black Sea Basin (biodiversity, ecosystem services, contributions to coastal communities) 2
- Key environmental threats facing the Black Sea (pollution, invasive species, habitat loss, climate change) 2
- Project objective: enhancing environmental and ocean literacy among youth, NGOs, and local authorities 3
- Purpose of the policy document: contributing to environmental education and policymaking processes in the Black Sea 3

2. KEY APPROACHES 4

- Lifelong Learning 4
- Global Citizenship 4
- Nature-Centered Approach and its implementation from a human-centred perspective 5

3. CURRENT STATUS of ENVIRONMENTAL and OCEAN LITERACY in the BLACK SEA 6

- Key projects and initiatives in Black Sea region 6
- *Current situation and educational initiatives in Türkiye* 6
- Education Initiatives and Progress 7
- Challenges Encountered 8
- Focus Group Workshop Findings 9
- *Current situation in Bulgaria* 10
- Focus Group Workshop Findings 10
- *Current situation in Greece* 12
- *Environmental and ocean literacy progress over the years* 12
- Focus Group Workshop Findings 12

4. INTERNATIONAL WORKSHOP OUTPUTS 14

- National & Local Environmental and Ocean Literacy 14
- Regional & Cross-Border Cooperation, NGOs, and Youth 15
- Proposed New Policies 16
- Consensus among partners 17

5. POLICY RECOMMENDATIONS 19

- National & Local Level Education and Capacity Building 19
- Regional / Cross-border Cooperation, NGO & Youth Participation 19
- Overall Conclusion 20

6. CONCLUSION and POLICY CALL 21

- A shared vision for the Black Sea Basin 21
- The path forward 23

EXECUTIVE SUMMARY

The Black Sea region faces escalating environmental pressures driven by land-based pollution, inadequate waste management, weak enforcement of environmental legislation, and limited public awareness of ecosystem interdependencies. These challenges are compounded by fragmented governance, insufficient cross-border coordination, and a gap between scientific knowledge and decision-making processes. Without systemic intervention, environmental degradation threatens biodiversity, economic stability, and the long-term well-being of coastal and inland communities.

This White Paper presents a regional policy framework for strengthening environmental and ocean literacy as a structural response to these challenges. It recognizes literacy not only as an educational objective but as a governance tool that supports informed decision-making, compliance, and civic participation. The approach links education systems, public institutions, civil society, and youth engagement within a coherent strategy aligned with European Union environmental priorities and global sustainability commitments.
Three interdependent action pillars are proposed:

1. **Institutional integration of environmental and ocean literacy**

Environmental literacy should be embedded across formal and non-formal education systems, teacher training programmes, and lifelong learning initiatives. Standardised regional frameworks and shared educational resources are needed to ensure continuity and quality of knowledge across Black Sea countries.

2. **Strengthening governance through knowledge-based decision-making**

Policy effectiveness depends on accessible data, science–policy dialogue, and institutional capacity to translate environmental knowledge into regulation and enforcement. Open data platforms, improved inter-agency coordination, and evidence-informed policy processes are essential. Regional and cross-border cooperation should further support NGO capacity, youth engagement, and institutional partnerships. Expanding funding and capacity-building for local NGOs, establishing sustained regional NGO networks, and promoting government–academic–NGO co-creation are key priorities.

3. **Institutionalised youth and community participation**

Young people and local communities must be recognised as active stakeholders in environmental governance. Structured mechanisms for youth participation, community-based monitoring, and NGO engagement can enhance accountability, public trust, and policy implementation. Youth participation should be formalized through Youth Ocean Councils, advisory roles in policymaking, and expanded incentives and youth-led citizen science programs.

The Black Sea's semi-enclosed nature and unique ecological structure make regional cooperation indispensable. A coordinated literacy-driven framework can support pollution prevention, ecosystem restoration, and sustainable resource management across national borders. By integrating education, governance, and civic participation, this framework provides a scalable model for transforming environmental awareness into systemic resilience, contributing to healthier ecosystems, stronger institutions, and more sustainable regional development.

1. INTRODUCTION

Importance of the Black Sea Basin (biodiversity, ecosystem services, contributions to coastal communities)

The Black Sea is one of the relatively young seas in the world. Of all the continental seas – such as the Aegean, Baltic, and Mediterranean – the Black Sea is the most isolated of the Global Ocean. Due to this, many large rivers flowing into the Black Sea maintain its relatively low salinity (about 17-18 %) on the surface layer. And exactly in this layer, extending down to about 100 m deep, almost the entire life is contained. The conditions in the deep-sea layer, located below the surface layer to the bottom (up to ~ 2,000 m), are fundamentally different, the difference being so drastic that they can be likened to two separate ecological universes. In the deep layer, the water is saltier and heavier. It almost does not mix with the water of the surface layer, which prevents the penetration of oxygen in it. That's the main reason for the lack of complex life forms there. However, many bacteria decompose sinking debris from the bodies of pelagic inhabitants and release hydrogen sulfide as a by-product of their metabolism, which accumulates and makes conditions at these depths even more hostile. This is why only 13% of the Black Sea's volume is habitable.

The importance of Black Sea biodiversity lies in its unique and fragile ecosystems, which provide vital goods and services, support local economies through fisheries and recreation, serve as a critical habitat for migratory birds, and offer significant biodiversity for scientific study and climate change prediction. Being a wild ecosystem, the Black Sea provides all the necessary resources to our society, and especially to coastal communities. The Black Sea basin provides various ecosystem services, including **provisioning services** like food and water, products from marine organisms have the potential for medicinal use; **regulating services** such as climate regulation, water filtration, carbon sequestration, and flood protection from coastal wetlands; **supporting services** like nutrient cycling and biodiversity maintenance for species and habitats; and **cultural services** such as recreation and tourism.

Key environmental threats facing the Black Sea (pollution, invasive species, habitat loss, climate change)

The poor species diversity, the almost complete isolation from the Global Ocean, the relatively low salinity of the water, and the numerous large rivers flowing into it place the Black Sea at the forefront of the list of the world's most endangered seas due to environmental disasters. All this makes it particularly susceptible to pollution, eutrophication, climate change impacts like sea-level rise and erosion, and, more recently, the environmental and security consequences of regional war. The key environmental threats facing the Black Sea are as follows:

- **Eutrophication**: Nutrient pollution from agriculture and wastewater, oxygen depletion.
- **Marine Litter**: human-made materials, with plastics being the most significant component.
- **Chemical Pollution**: toxic substances from industrial activities, chemical runoff, pesticides.
- **War-Related Pollution**: military debris releasing heavy metals and chemicals, oil spills.
- **Climate Change**: Warming waters and salinity change threaten the delicate two-layered structure and can disrupt the food web.
- **Coastal Erosion**: sea level rise, strong wave action, and coastal flooding wear down or carry away the land masses.

- **Invasive Species**: non-native organisms that can cause significant harm to the environment and the economy.
- **Overfishing**: catching fish faster than they can reproduce, leading to depleted fish populations.

In order to tackle these threats, the Convention on the Protection of the Black Sea Against Pollution ("Bucharest Convention") was signed in Bucharest in April 1992 and ratified by all six legislative assemblies of the Black Sea countries at the beginning of 1994. The implementation of the Convention is managed by the Commission for the Protection of the Black Sea Against Pollution (also sometimes referred to as the **Istanbul Commission**), and its Permanent Secretariat in Istanbul, Türkiye.

Project objective: enhancing environmental and ocean literacy among youth, NGOs, and local authorities

The overall objective of the project EOL BSB00432 “Environmental and Ocean Literacy in the Black Sea Basin” is to increase environmental and ocean literacy and green competences among young adults in the target regions, including the coastal areas of the Black Sea in Türkiye, Bulgaria, and Greece, to contribute to the conservation of nature and biodiversity in the Black Sea Basin. The project contributes to the specific objective 7, field of action 2: “actions on environmental protection at all educational levels”.

Purpose of the policy document: contributing to environmental education and policymaking processes in the Black Sea

The purpose of this document is to advocate for and guide the expansion of ocean literacy initiatives to create an ocean-literate society. It does this by providing a framework for understanding ocean literacy that includes more than just knowledge, advocating for integrating ocean literacy into government policies and education systems, and promoting ocean-literate principles to achieve broader goals like sustainability, behavior change, and equitable participation in ocean decision-making.

- To encourage governments to recognize ocean literacy as a vital tool for marine, social, and cultural development, and to embed it within national and international policies.
- To move beyond a simple knowledge-based approach by including factors like emotional connection, active participation in decision-making processes, and a sense of marine citizenship.
- To offer a structured approach and a set of recommendations to guide organizations, educators, and policymakers in implementing ocean literacy initiatives.
- To promote a deep understanding of the ocean's influence and humanity's influence on the ocean, which can lead to more sustainable behaviors, effective stewardship, and a stronger connection to the marine environment.

2. KEY APPROACHES

Key approaches[1] for ocean literacy include foundational education based on the Essential Principles of Ocean Literacy, integrating social-emotional and behavioral learning to foster active citizenship, leveraging diverse communication methods like technology and storytelling, and contextualizing learning to include local and Indigenous knowledge and address environmental justice. Expanding on the original six dimensions (knowledge, behavior, communication, attitude, awareness, and activism), a more comprehensive approach includes emotions, values, access, adaptive capacity, and trust.

Lifelong Learning

In a rapidly changing world, where technology, globalization, climate change, growing polarization of societies, and demographic and social dynamics are reshaping every aspect of our lives, education is undergoing a transformational journey. Education is no longer confined to traditional school-based education for children but has expanded to encompass lifelong and life-wide learning.

Lifelong learning[2] is the continuous and voluntary pursuit of knowledge and skills throughout one's entire life, extending beyond formal education and driven by personal or professional development. It involves adapting to a rapidly changing world by updating existing skills, learning new ones, and nurturing curiosity for personal enrichment. This practice enhances employability, mental sharpness, and personal fulfillment, fostering resilience and adaptability for navigating life's challenges.

- improves employability through reskilling and upskilling of workers in a changing world of work;
- enables individuals to master the digital revolution;
- empowers learners of all ages to take climate action;
- supports health and well-being across communities;
- helps countries respond to aging societies, with the global population of people aged 65 or older expected to outnumber youth by 2050;
- promotes tolerance and democratic values in the face of deep social and economic changes.

Global Citizenship

Global citizenship[3] is the belief that all people belong to a single, interconnected global community and have shared responsibilities for the world's social, political, environmental, and economic issues. It involves cultural awareness, empathy for others, and a commitment to working collectively to address global challenges like climate change, environmental conservation, poverty, and human rights for the benefit of all.

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1) https://www.sciencedirect.com/science/article/pii/S0025326X22011493
2) https://www.unesco.org/en/lifelong-learning/need know#:~:text=Lifelong%20learning%20is%20a%20process,All%20levels%20of%20education
3) https://www.un.org/en/academic-impact/global-citizenship

The idea of global citizenship is usually associated with people seeking to make positive changes in the world. For NGOs, engaging in global citizenship requires proactive campaigns.

General principles:

- **Interconnectedness:** Recognizing that people across the world share common experiences and are linked by global issues, despite their different cultures and backgrounds.
- **Shared Responsibility:** Understanding that individuals have civic duties not only to their own communities but also to the global community as a whole.
- **Empathy and Cultural Awareness:** Cultivating an appreciation for diverse cultures, perspectives, and ways of life, and striving to understand others' experiences.
- **Action and Engagement:** Actively participating in local and global initiatives to improve the world by advocating for human dignity, justice, and social accountability.

Nature-Centered Approach and its implementation from a human-centred perspective

The nature-centric approach, particularly ecocentrism, originates from figures like Aldo Leopold and his "Land Ethic" and Arne Naess and the Deep Ecology movement in the mid-20th century. This viewpoint challenges the human-centered (anthropocentric) perspective by arguing that ecosystems and the planet as a whole should be the focus of moral consideration. Historical and indigenous cultures have also long held ecocentric worldviews.

A Nature-Centered Approach[4] is a broad philosophical, design, and lifestyle shift from human-centered (anthropocentric) to nature-centered (ecocentric) perspectives, prioritizing the intrinsic value of the natural world and seeking to integrate natural systems into human activities. This approach encourages lifestyles that minimize environmental impact, fosters a deeper connection with nature, and promotes ecological well-being through practices like Nature-Centered Design and Nature-Centered Living.

Ocean literacy aims to reach absolutely every person on the planet - whether they are anthropocentric or ecocentric. The goal of ocean literacy is not to change people's philosophical views and worldviews, but despite of these, to make them feel and understand their connection to wild ecosystems. Some people perceive their relationship with wildlife from an emotional and more sentimental perspective, while others take a more practical approach, realizing their dependence on it. Both groups can be united by ocean literacy and share common interests and concerns, albeit for different motives, but with common outcomes.

That is why, for the White Paper, we formulated the so-called nature-centered approach from a human-centred perspective. With this, we emphasize the importance of reaching every single person, as absolutely all people on the planet depend on the resources provided by ecosystems and have a responsibility for their preservation.

4) https://www.dnyandases.com/post/nature-centered-approach

3. CURRENT STATUS OF ENVIRONMENTAL AND OCEAN LITERACY IN THE BLACK SEA

Key projects and initiatives in Black Sea region

- **SHORE (Mission Ocean and Waters):** An EU Mission project that works to enhance ocean literacy in schools across five regions, including the Black Sea, through community activities, exhibitions, and the SHORE online platform for teachers and students.
- **DOORS Black Sea:** This project conducts "Love the Ocean" workshops to promote ocean literacy across the Black Sea region.
- **BRIDGE Black Sea:** An online directory and network that compiles various ocean literacy initiatives in the region. These include a wide range of activities like beach cleanups, citizen science projects, and summer schools in countries such as Bulgaria, Georgia, Moldova, Romania, Türkyie, and Ukraine. This project advances knowledge through interconnected nodes, one of which focuses on "Empowered Citizens" to advance ocean literacy and Blue Growth. The European Marine Science Educators' Association (EMSEA) regional group on the Black Sea was set up as part of the Bridge-BS project in 2022.
- **EmpowerUs:** A three-year project that aimed to empower coastal communities to transition towards more resilient, inclusive, and sustainable coastal development (https://empowerus-project.eu/).

These four projects were funded by the European Union's Horizon 2020 research and innovation programme.

Current situation and educational initiatives in Türkiye

Although interest in environmental and ocean literacy is increasing in Türkyie, the Black Sea ecosystem remains vulnerable due to pressures such as pollution, invasive species, and climate change. These stress factors threaten marine life and create long-term social, economic, and environmental risks across the country. In response to these challenges, Türkyie's legal framework establishes a clear mandate for action; the Environmental Law No. 2872 explicitly assigns public institutions the responsibility to carry out environmental awareness and environmental education activities. Furthermore, as a party to international frameworks such as the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention) and the Black Sea Strategic Action Plan, Turkey adopts approaches that recognize the need for scientific knowledge and policies to be widely understood and implemented.

The United Nations Sustainable Development Goals, particularly SDG 14 (Life Below Water), and the UN Decade of Ocean Science initiative have also become fundamental components of environmental and ocean literacy education, awareness, and policy processes in Türkyie. The main objective is to increase the public's knowledge about the seas and ecosystems, thereby supporting more effective implementation of environmental policies.

Education Initiatives and Progress

Various actors have been implementing initiatives to enhance environmental and ocean literacy in Türkyie. In recent years, universities, NGOs, local authorities, and the institutions have become increasingly visible in this field:

- The Ministry of National Education has implemented the elective course “Environmental Education and Climate Change” in lower secondary schools starting from the 2022–2023 academic year, strengthening environmental literacy in formal education.

- Universities and NGOs offer online ocean literacy trainings for students, the general public, and professionals (for example, Dokuz Eylül University provides trainings on marine ecosystems, pollution, and biodiversity in collaboration with international organizations; TÜDAV’s Ocean Literacy Courses have been offering free online modules on marine biology, oceanography, marine pollution, marine law, and policy since 2022). Implemented by the Turkish Marine Research Foundation (TÜDAV) in cooperation with the International Ocean Institute (IOI), this programme is delivered free of charge and online, with a total duration of approximately 27 hours. The training is conducted in Turkish and targets university students and graduates, local authorities, policymakers, educators, media representatives, and the general public. Participants who successfully complete the programme receive a certificate, and the course is currently in its eighth cycle.

- Scientific data and analyses produced by marine research centres within universities support public awareness and contribute significantly to a more comprehensive understanding of marine ecosystems (for example, the LitOUTer – Reducing Marine Litter and Raising Public Awareness for the Protection of the Black Sea Ecosystem project, implemented under the Black Sea Basin CBC Programme and led by Karadeniz Technical University (KTU), combines scientific research with environmental and ocean literacy trainings for schools and youth, coastal clean-up activities, and awareness-raising workshops. Through cross-border cooperation and multi-stakeholder implementation, the project also contributes to the development of evidence-based recommendations for policymakers.

- Citizen science projects ensure active public participation in monitoring plastic pollution, reporting marine litter, and collecting biodiversity data (for example, WWF-Turkey’s “Adopt a Beach” Programme enables volunteers to monitor coastal plastic waste and raise awareness about marine pollution). Covering approximately 150 beaches along Turkey’s coastline of over 8,000 km, the programme is based on the UNEP “Adopt a Beach” model and the methodology developed by the Hellenic Centre for Marine Research (HCMR). It engages youth, schools, and local communities in marine conservation, and a pilot implementation at Erenköy Beach in Istanbul has demonstrated its feasibility. The collected qualitative and quantitative data support policy-making and education processes.

- NGOs and volunteer programs carry out awareness-raising campaigns on marine pollution, plastic waste, and sustainability.

- **Administrative and Financial Gaps:** Although legislation and policies exist, deficiencies in financing, coordination, and oversight remain among the main factors limiting the effectiveness of environmental and marine management. Coordination between implementing institutions is often weak, budgets for environmental and marine management are insufficient, and sustainable financing mechanisms are lacking. In addition, the lack of up-to-date and reliable data, particularly long-term monitoring of coastal and marine ecosystems, constrains decision-making and implementation processes. As a prominent example of these administrative challenges, regional assessments indicate that despite its socio-economic importance, the fisheries sector has historically lacked an integrated management strategy and sustainable development frameworks.[8]

Focus Group Workshop Findings

As part of the EOL Project, an online workshop was conducted with a focus group representing the project's target audience in Türkiye. Participants were asked about their areas of interest related to the ocean and seas, their expectations from educational programs, and their preferred learning methods. Accordingly, the participants' responses are as follows:
The focus group consisted of individuals aged 18–35, representing the project's target audience

Areas of interest (ocean and marine topics):

- Marine and ocean biodiversity and their effects on ecosystems
- Plastic pollution and microplastics
- Impacts of climate change on the seas
- Sustainable fishing and the effects of maritime traffic on ecosystems
- The role of oceans as carbon sinks
- Coastal management and habitat conservation issues

Expectations from educational programs:

- Ways to protect the seas through individual and collective actions
- Information on invasive species and indicators of ocean health
- Understanding coastal protection laws and environmental regulations
- Regional marine culture and traditions (stories, songs, gastronomy, etc.)
- Opportunities for research- and observation-based learning

Preferred learning methods:

- Experiential learning and field activities (coastal observations, outdoor activities)
- Group work and interactive exercises
- Simulations and problem-solving activities
- Use of social media and digital tools to support educational materials

Although the number of participants was limited, the findings provide preliminary insights into the interests of young people in Türkiye regarding ocean and marine topics, as well as their preferred educational methods. These findings also contribute to the overall situation analysis.

8) https://www.dnyandases.com/post/nature-centered-approach

Current situation in Bulgaria

Environmental and ocean literacy at the European Union level is growing, with increased focus on educational initiatives like "open-schooling" and projects involving stakeholders from sport to government. However, this progress happens alongside continued environmental degradation, as many European marine ecosystems remain far from achieving "good environmental status" due to factors like pollution and habitat loss. The goal is to link improved literacy with better policy implementation to help achieve these conservation objectives.

Environmental and ocean literacy in Bulgaria is currently developing through dedicated training programs, particularly for youth and professionals, aimed at addressing Black Sea issues like pollution and invasive species. There is a growing recognition of the need for broader public engagement, with new initiatives and EU-funded projects focusing on non-specialist education to foster environmental responsibility. While official regulatory frameworks exist, recent activities are a push to translate scientific knowledge and policy into practical, widespread understanding and action.

Environmental and ocean literacy progress:

- Projects are using various models to increase literacy, such as "open-schooling", which involves schools, NGOs, and local authorities, and programs using sport as a tool to reach young people.
- There's a growing effort to engage diverse groups, including municipal and state officials, and to provide them with training to conduct their own local environmental education programs.
- Efforts are underway to integrate ocean literacy into existing policies, such as the Marine Strategy Framework Directive (MSFD), and to align it with initiatives like maritime spatial planning (MSP).

Environmental and ocean literacy challenges:

- "Good environmental status" as set by the MSFD?
- Challenges like nutrient and chemical pollution, underwater noise, and plastic waste continue to negatively impact the marine ecosystem.
- The high intensity of land and sea use, over-exploitation, and destructive practices like bottom trawling are leading to the degradation of habitats.
- Despite an increase in the number of protective measures, experts note that many actions need to be more ambitious and that financing and governance need improvement to be effective.

Focus Group Workshop Findings

A survey among young adults was conducted in Bulgaria before the EOL project's online workshop. It included four main questions, and the results showed the following preferences:

- What topics related to seas and oceans are of interest to you? The highest share (40%) was for animal and plant diversity of the Black Sea, and the second score (36.5%) was for pollution and threats to the sea and its inhabitants. Other replies included: care and conservation of the Black Sea; climate change and its impact on the Black Sea; all listed topics; and history and evolution of Black Sea inhabitants.

- What knowledge and skills would you like to acquire from a training dedicated to the Black Sea? The highest score (41.2%) was for the answer “The ways/methods for conservation of the sea and why it is important to us”. The second most voted answer (22.4%) was “How marine ecosystems function” and the third (18.8%) was “Methods to study/survey the sea”. The lowest score (14.1%) was for the reply “About the resources that the sea provided and their economic importance”.

- What methods would you prefer to be used in the education/training program? The highest share (80%) of all respondents replied “Experiential learning-outdoor activities”. The second rank (9.4%) was for PPT presentations/lectures, and the third was for “Group discussions”, with “Theoretical lectures” gaining the lowest interest rate.

- Are there any platforms you recommend to reach the target audience aged 18-35? The replies corresponded with results from other sociological studies for preferred social media by different groups, and logically, for our target group, the most preferred was Instagram (48.2%), followed by TikTok (18.8%) and Facebook (14.1%). A bit surprisingly, YouTube gained the fewest preferences.

The Ocean & Society survey was conducted within the EmpowerUs project in Bulgaria and covered 1,106 people[9]. Its main findings include:

- 47% recognize that the ocean influences their daily lives.
- 58% know that their daily actions influence the ocean.
- 76% are willing to change their lifestyle to support ocean health.
- 12% do not feel they have access to the resources and tools that they need to face the challenges that their communities face.

The main findings by topic and recommendations are presented below in the boxes:

OCEAN LITERACY

- 74% value the ocean for the benefit of clean air and water, either highly or very highly; 73% for climate protection; and 71% for energy & resources.
- 55% feel concerned when they think about the health of the ocean and waterways. Women and young people are more likely to believe that the ocean is healthy compared to men and older people.
- Ocean threats of most concern: Pollution; Plastic and marine litter; Climate change.
- 44% feel responsible for the health of the ocean.
- 76% are willing to change their lifestyle if they know it would help the ocean.

COMMUNITY EMPOWERMENT

- 95% feel they have at least some knowledge they need to overcome challenges their community faces. Younger people and those without a college/university education feel they have less knowledge than older people.
- 95% are willing to take action.
- 85% feel they have access to the resources and tools they need.
- 12% feel they do not have access to the resources and tools they need.

RECOMMENDATIONS

- Government and projects should lead with co-designed & actionable ocean literacy strategies, promoting common multisectoral goals and priority action areas with committed funding.
- Fund ocean literacy campaigns that focus on women and young people.
- Improve the accessibility of resources for communities.

9) McRuer et al. 2025. The Ocean & Society Survey: A Global Tool.

Responses to the question “Who should take significant responsibility for ocean health? (And how much do they trust them?)” were as follows:

- Government: 59% (27%)
- National environmental authorities: 56% (48%)
- Industry & big business: 55% (31%)
- The United Nations: 52% (47%)
- Local communities and small businesses: 30% (39%)
- Individuals: 24% (36%)

Main identified Policy Drivers include:

- Sustainable Development Goals
- United Nations Decade of Ocean Science:
- ‘Restore society’s relationship with the ocean.’
- UNESCO Barcelona Statement
- European Ocean Pact prioritises restoring ocean health, supporting coastal communities, and advancing knowledge.

We can conclude that the two independent audiences of both projects (EOL and EmpowerUs) shared similar opinions, providing further evidence about the correctness of the conclusions and drawn recommendations.

Current situation in Greece

Environmental and ocean literacy progress over the years

Environmental Education (EE) emerged internationally in the mid-20th century and was formally introduced in Greece in the 1970s as an interdisciplinary field integrated across school subjects. Early initiatives focused on teacher training, pilot school programmes, and European collaboration, leading to the first implementations in secondary education in the early 1980s. EE was fully institutionalised with Law 1892/1990, which incorporated it into school curricula and established Environmental Education Centres and Coordinators nationwide. Throughout the 1990s and 2000s, EE expanded through interdisciplinary school projects, teacher networks, and alignment with European and UNESCO sustainability frameworks, evolving into Education for Sustainable Development. Central to this evolution is environmental literacy, encompassing knowledge, skills, values, and responsible behaviour, although its conceptual definition remains subject to academic debate.

Focus Group Workshop Findings

The EOL Project seeks to advance Ocean Literacy through targeted outreach, including four online workshops held in late 2024 that brought together participants from diverse sectors and educational levels, with one workshop conducted nationally in Greek. Discussions highlighted major challenges, including marine pollution, biodiversity loss, climate change, and unsustainable human activities, underscoring the urgent need for environmental education and awareness.

Participants emphasized collaboration, teacher support, and the development of tailored, experiential programmes—such as beach clean-ups, ecological observations, and expert-led activities—focused on local and global marine issues. To engage young adults (18–35), interactive and gamified approaches, social media platforms, volunteering, and activism were recommended, alongside accessible and engaging content that combines education with entertainment; key outcomes were collected through Padlet to support collaborative idea-sharing and reflection.

1st Discussion Topic: Identify challenges and issues of natural and environmental significance that you consider critically important in the context of young people's familiarisation with ocean literacy concepts.

Summary of Responses:

- The loss of biodiversity and marine pollution.
- Developing an understanding of the ocean as more than just a resource for development, economic activity, or entertainment.
- Recognising the urgency of environmental education due to the scale of current natural disasters, which are projected to increase by up to 40% by 2050, underscores the critical need for the younger generation to receive robust environmental education.
- Awareness of the consequences of climate change, emphasising that these effects are closer to us than often perceived.
- Rising sea levels due to climate change (a consequence) threaten coastal zones and marine habitats, causing significant disruption to ecosystems and human communities alike.
- Understanding how our actions, whether direct or indirect (e.g., through travel or holiday behaviours), harm marine environments.
- Other themes: oceans, climate change, pollution, overfishing, biodiversity, tourism, sensitisation, access to education, collaboration, protective policies, participation, educational programmes, teacher training, and thematic school networks.

2nd Discussion Topic: Proposals for designing an environmental programme aimed at familiarising young people (aged 18-35) with the concept of ocean literacy.

Summary of Responses:

- Experiential participation in activities focused on environmental protection.
- Collaboration with expert scientists to provide credibility and depth.
- Organising training sessions, volunteering opportunities, and visits to nature preservation sites, aquariums, and research centres.
- Highlighting the problem of marine pollution in local areas.
- Providing information on maritime challenges that are often ignored or underestimated (e.g., the anticipated emergence of millions of climate refugees in the coming years).
- Emphasising the severity of these issues to foster a sense of urgency.
- Understanding the importance of environmental education and ocean literacy beyond traditional school and university frameworks.
- Empowering teachers, educators, and trainers to implement programmes without relying solely on voluntary efforts.
- Offering experiential and interactive workshops on local beaches, where participants can engage in practical activities such as beach clean-ups and ecological observation.

- Disseminating climate change information using relatable, up-to-date examples from daily life in Greece.
- Educating young people about the biodiversity of their region.
- Promoting fishing literacy in areas where fishing plays a significant role.
- Introducing environmental education tailored to tourist regions, applying similar principles to those used in fisheries.
- Using the correct terminology and measurements and using the right tools designated by maritime education experts, cultivating a culture of non-misinformation
- Other themes: oceanography, marine biodiversity, ecosystems, pollution, climate change, awareness of environmental issues, data analysis, respect for nature, responsibility, participation, sustainability, formation of environmental groups and teams, competitions, clean-up campaigns, observation of marine species, and fostering a marine culture among citizens.

3rd Discussion Topic: What methods can be employed, and through which channels and media can the young audience be approached?

Summary of Responses:

- Development of interactive workshops or webinars on platforms like Zoom, combining education and entertainment with a long-term strategy to sustain young people's interest.
- Implementation of experiential educational programmes or laboratories, alongside the use of social media for creating engaging content that is humorous or entertaining.
- Promotion of activism to encourage active participation and awareness.
- Offering platforms for young people to present their own challenges, enabling them to take on a protagonist role through active participation and teamwork approaches.
- Creation of volunteering opportunities to engage young audiences directly in meaningful activities.
- Designing easily accessible social media content that competes with mainstream content, using today's most popular platforms, such as TikTok, Reels, YouTube, and podcasts.
- Other themes: experiential learning activities, competitions and awareness campaigns, organisation of events, podcasts, webinars, and gamified experiences, development of applications and online platforms tailored to youth engagement.

4. International Workshop Outcomes

National & Local Environmental and Ocean Literacy

Shared Challenges

- Environmental and ocean literacy (EOL) is fragmented and inconsistently integrated into national curricula.
- Weak coordination between ministries, local authorities, academia, and NGOs.
- Low public awareness, especially in inland regions, about the connection between land-based activities and marine ecosystems.
- Youth disengagement, driven by a lack of motivation, incentives, and participatory mechanisms.
- Insufficient legal enforcement, monitoring systems, and up-to-date scientific data in education.

Country-Specific Emphases

Türkiye: Gaps between coastal and inland knowledge, weak enforcement of marine protection, and

public misunderstanding of Marine Protected Areas.

Greece: Sea blindness, youth anxiety toward marine environments, limited educator capacity, and weak bottom-up governance.

Bulgaria: Lack of ecosystem mapping, outdated textbooks, weak consultation mechanisms, and low youth engagement.

Identified Opportunities

- Youth mentorship and peer-to-peer learning.
- Sustainable tourism models ("win–win" approaches).
- Use of digital tools, AI, citizen science, and open data.
- Strong NGO presence and existing regional cooperation frameworks (Black Sea Commission, UNEP-MAP, EU programs).

Regional & Cross-Border Cooperation, NGOs, and Youth

Key Issues

- Heavy dependence on EU funding and complex administrative procedures.
- Small NGOs struggle with capacity and access to funding.
- Youth often remain symbolic participants, not real decision-makers.
- Language barriers and weak implementation of regional conventions.

Opportunities

- Strengthening NGO networks and volunteer systems.
- Depoliticizing and diversifying funding sources.
- Creating structured youth consultation and advocacy mechanisms.
- Using regional platforms (COP processes, civil society dialogues) more effectively.

Rationale of identified opportunity examples:

- Environmental and Ocean Literacy (EOL) as a Cross-Sectoral Policy Priority

Rationale: EOL is discussed across various sectors, including education, tourism, governance, youth, NGOs, and digitalization, but not framed as an overarching policy pillar.

- Inland–Coastal Connectivity and Watershed-Based Governance

Rationale: Strong emphasis is placed on river pollution, inland responsibility, and land–sea interconnectedness, especially for Türkiye and Bulgaria.

- Legal Enforcement, Compliance, and Accountability Mechanisms

Rationale: Legal gaps are discussed, but enforcement and accountability are not elevated as a distinct policy axis.

- Youth as Decision-Makers, Not Stakeholders

Rationale: Youth participation is repeatedly criticized as symbolic and passive.

- NGO Capacity Building and Equitable Access to Funding

Rationale: NGO challenges are detailed but scattered across sections.

- Digitalization, Open Data, and Citizen Science for EOL

Rationale: Digital tools, AI, open data, and citizen science appear frequently but lack a unified policy framework.

- Regional and Cross-Border Environmental Governance

Rationale: Regional cooperation is discussed separately, but should be elevated to a core policy chapter.

Proposed New Policies

- Education & Awareness
- Mandatory EOL modules at all education levels
- Teacher training and regional educator networks
- Scientist-in-schools programs
- Environmental journalism training
- Local Governance & Municipal Action
- Municipal Nature-Based Solutions Offices
- Black Sea / Marine Learning Hubs
- Mandatory environmental quality standards for coastal municipalities
- Monitoring, Science, and Data
- National and regional open-data platforms
- Real-time environmental monitoring systems
- Citizen science data integration into policymaking
- Youth Engagement
- Youth Consult of the Sea initiatives
- Youth environmental councils at the municipal and national levels
- Youth-led citizen science and monitoring programs
- Award and incentive mechanisms for youth participation
- Equalized funding access for small NGOs
- NGO networking and cooperation platforms
- Co-creation and co-design mechanisms with the government
- Regional Cooperation
- Environmental and Ocean Literacy as a priority in cross-border programs
- Regional internships and exchange schemes
- Annual regional Ocean Literacy Forums
- Blue Schools and youth exchange networks

The workshop outcomes indicate the need to expand the policy framework beyond education-focused interventions toward an integrated model that includes governance reform, youth empowerment, NGO capacity building, digital innovation, and regional cooperation.

Consensus among partners

Partners broadly agree that strengthening Environmental and Ocean Literacy (EOL) is essential for effective environmental governance, climate resilience, and sustainable development in the region, and that this requires systemic, coordinated, and participatory action at local, national, and regional levels.

Key Areas of Consensus

Environmental & Ocean Literacy Must Be Systemically Embedded

Partners agree that:

- EOL should be integrated horizontally into national education curricula, not treated as an optional or isolated topic.
- Education must be interdisciplinary, linking climate change, biodiversity, SDGs, the economy, and daily life.
- Early-age education and lifelong learning are critical to long-term behavioral change.

Shared view: Awareness alone is insufficient without structural integration into education systems.

Inland–Coastal Interdependence Is Widely Underestimated

Partners consistently emphasize that:

- Marine degradation is strongly linked to inland activities (rivers, agriculture, waste, urbanization).
- Inland communities must be equally targeted by ocean literacy policies.
- Watershed- and ecosystem-based approaches are necessary.

Shared view: "The sea begins on land" should be a guiding policy principle.

Youth Engagement Must Shift from Symbolic to Institutional

There is a strong consensus that:

- Youth are currently underrepresented in decision-making, despite high potential.
- Participation mechanisms must be formalized (youth councils, consultative bodies).
- Youth-led citizen science, advocacy, and monitoring should be supported and recognized.

Shared view: Youth should be co-creators and decision-shapers, not just beneficiaries.

NGOs Are Key Implementers but Face Structural Barriers

Partners agree that:

- NGOs are essential for outreach, education, and community engagement.
- Small and local NGOs face funding, administrative, and capacity constraints.
- Equal access to funding and capacity-building is necessary for impact.

Shared view: Strengthening NGOs strengthens policy implementation on the ground.

Legal Frameworks Exist, but Enforcement Is Weak

Across countries, partners note that:

- Environmental laws and conventions exist, but are poorly enforced.
- Monitoring, compliance, and accountability mechanisms are insufficient.
- Restoration obligations for environmental damage must be strengthened.

Shared view: Policy effectiveness depends more on enforcement than on new legislation alone.

Science, Data, and Digital Tools Should Be Open and Accessible

Partners consistently support:

- Open-source environmental data and shared monitoring platforms.
- Use of digital tools, AI, and citizen science to improve data collection and awareness.
- Stronger links between scientists, schools, communities, and policymakers.

Shared view: Transparency and access to data improve trust, learning, and decision-making.

Regional & Cross-Border Cooperation Is Essential

There is a shared understanding that:

- Marine ecosystems transcend national borders, especially in the Black Sea and Mediterranean.
- Environmental and Ocean Literacy should be a priority theme in cross-border programs.
- Regional networks for educators, NGOs, youth, and scientists are needed.

Shared view: No single country can address marine challenges in isolation.

Communication and Public Engagement Are Critical Weak Points

Partners agree that:

- Public communication on marine issues is often unclear or ineffective.
- Media professionals need better scientific training.
- Simple, positive, and solution-oriented messaging works best.

Shared view: Better communication is as important as better policy.

Partners from Türkiye, Greece, and Bulgaria agree that advancing environmental and ocean literacy is a shared regional priority that must be embedded in education systems, supported by enforceable governance frameworks, empowered NGOs, meaningful youth participation, open scientific data, and strong cross-border cooperation. They emphasize that marine protection depends on inland–coastal interconnectedness, effective communication, and participatory decision-making, and that long-term success requires moving from fragmented initiatives to coordinated, inclusive, and institutionalized action.

5. Policy Recommendations

Local authorities in the Black Sea region play a critical role in advancing ocean literacy by developing and implementing policies that strengthen education systems, encourage public participation, and support citizen science initiatives.

National and Local Level Education and Capacity Building

- Environmental and ocean literacy should be mandatorily integrated into all levels of formal education in order to raise awareness from an early age, promote pro-environmental behavior, and ensure the long-term protection of marine and coastal ecosystems.
- Textbooks and educational materials should be regularly updated to reflect the latest scientific knowledge and data.
- Regional teacher-training programs and structured knowledge-sharing networks should be established and sustained over time.

Governance and Legal Frameworks

- The legal protection of marine and coastal areas, as well as monitoring and effective enforcement, should be strengthened.
- Dedicated municipal units for nature-based solutions and climate adaptation should be established and provided with adequate resources.
- Compliance with recognized environmental standards (e.g., Blue Flag certification) should be mandatory for coastal municipalities.

Technology and Data

- Centralized digital platforms should be developed and maintained for environmental monitoring, volunteer coordination, and open-access data sharing.
- Citizen science initiatives—particularly those linked to schools and local communities—should be actively promoted and supported.

Expected Impacts

- Improved pro-environmental behavior and increased environmental awareness from an early age.
- Enhanced ecosystem protection and climate resilience.
- Strengthened integration between scientific research, policymaking, and societal engagement.

Regional / Cross-Border Cooperation, NGO and Youth Participation

Non-Governmental Organizations (NGOs)

- Access to funding and institutional capacity-building opportunities for small and local NGOs should be expanded.
- Continuous NGO networks at the Black Sea and Mediterranean levels should be established and sustained.
- Co-creation and structured cooperation among governments, NGOs, and academic institutions should be actively supported.

Youth Participation

- Black Sea/Ocean Youth Councils should be established at the local, national, and regional levels.
- Awards, incentives, and youth-led citizen science programs should be launched and scaled up.
- Advisory roles for youth in marine and environmental policy-making processes should be formally institutionalized.

Cross-border Action

- Environmental and ocean literacy should be defined as a priority within cross-border cooperation programs.
- Regional internships, exchange programs, and “Blue Schools” networks should be developed and implemented.
- Annual regional Ocean Literacy forums should be organized to facilitate knowledge exchange and policy coordination.

Expected Impacts

- Strengthened youth leadership and increased ownership of policy processes.
- Enhanced regional cooperation and evidence-based, data-driven decision-making.
- Lasting public awareness and long-term stewardship of marine and coastal ecosystems.

Overall Conclusion

The workshop outputs demonstrate that environmental and ocean literacy is not only an educational priority, but also a necessity in terms of governance, participation, and cooperation. Participants converged on the following needs:

- Systemic reform of educational curricula;
- Strengthened legal and institutional frameworks;
- Empowered and adequately resourced non-governmental organizations;
- Meaningful and institutionalized youth participation; and
- Enhanced regional and cross-border cooperation.

Taken together, these measures are considered essential for protecting marine ecosystems, strengthening democratic environmental governance, and building resilient, ocean-literate societies across Türkiye, Greece, and Bulgaria.

6. Conclusion and Policy Call

A shared vision for the Black Sea Basin

Based on the full set of discussions, reflections, and policy recommendations presented in the document, the following shared vision for the Black Sea Basin can be clearly distilled. This vision reflects common priorities across Türkiye, Greece, and Bulgaria, as well as among civil society, academia, and youth participants—even if expressed differently across national contexts.

A resilient, well-governed, and interconnected Black Sea Basin in which informed and empowered communities—especially youth—actively protect marine and coastal ecosystems through strong environmental and ocean literacy, science-based decision-making, and sustainable cross-border cooperation.

Core Elements of the Shared Vision

An Ocean-Literate Society Across the Basin

Partners envision a future in the Black Sea region where:

- Environmental and ocean literacy is mainstreamed across all levels of education and extended into lifelong learning.
- Coastal and inland citizens understand the interconnectedness of rivers, land-based activities, and the sea.
- Awareness translates into responsible behavior, civic participation, and stewardship.

Vision anchor: An informed public as the foundation of marine protection.

Healthy and Resilient Marine and Coastal Ecosystems

The shared vision prioritizes:

- Protection and restoration of marine and coastal ecosystems, deltas, wetlands, and biodiversity hotspots.
- Reduction of pollution, unsustainable fisheries, and tourism pressures.
- Use of nature-based solutions to enhance climate resilience and ecosystem services.

Vision anchor: Ecological integrity as a prerequisite for social and economic well-being.

Youth as Stewards and Decision-Makers of the Basin's Future

Across all countries, partners align on:

- Youth are central to long-term protection and governance.
- The need for institutionalised youth participation, not ad hoc engagement.
- Youth-led citizen science, advocacy, and cross-border exchange/engagement.

Vision anchor: A new generation of "Black Sea stewards and ambassadors" actively shaping policies and practices.

Strong Civil Society and Inclusive Governance

The vision is based on the following assumptions:

- NGOs serve as key bridges between policy, science, and communities.
- Participatory, transparent, and bottom-up governance systems are essential.
- Equal access to funding and capacity-building for local actors is needed.

Vision anchor: Environmental governance in the Black Sea Basin is inclusive, locally grounded, and trusted by society.

Science-Based, Transparent, and Digitally Enabled Management

Partners agree on:

- Open-access scientific data and shared monitoring systems.
- Citizen science and digital tools that support early warning and learning.
- Stronger links between researchers, educators, and policymakers.

Vision anchor: Decisions affecting the Black Sea are science-based, transparent, and supported by shared data.

A Cooperative and Peaceful Regional Space

The document repeatedly emphasizes:

- The value of regional frameworks (the Black Sea Commission, EU programmes, UNEP-MAP).
- Cross-border networks for education, NGOs, youth, and research.
- Long-term, depoliticized cooperation focused on shared environmental goals.

Vision anchor: The Black Sea Basin functions as a space for cooperation; environmental protection strengthens regional trust and stability.

A Conservation-Based Sustainable Blue Economy

An underlying message throughout discussions on tourism, fisheries, and education is that:

- Economic activities must operate within ecological limits.
- Sustainability standards and codes of conduct (ethical principles) are essential.
- Environmental literacy supports responsible consumption and production.

Vision anchor: The Black Sea supports a sustainable blue economy that benefits communities while restoring ecosystems.

Strategic Vision Pillars

- Knowledge & Awareness: Ocean-literate citizens across the entire basin.
- Participation & Governance: Youth- and community-driven, inclusive decision-making.
- Cooperation & Resilience: Cross-border action for healthy, climate-resilient ecosystems.

Local authorities, national governments, and NGOs are jointly called to act now—by embedding ocean literacy, empowering youth, strengthening enforcement, and cooperating across borders—to secure a resilient and sustainable future for the Black Sea Basin.

Importance of youth participation in the process

- Long-term sustainability: Youth are seen as essential for ensuring continuity of environmental and ocean literacy efforts and for safeguarding the Black Sea ecosystem over time.
- From awareness to action: The document stresses that youth should move beyond passive awareness-raising to become active contributors through citizen science, monitoring, advocacy, and policy consultation.
- Improved policy relevance: Involving youth in decision-making leads to policies that better reflect real social and environmental concerns and increase public ownership of outcomes.
- Capacity building and leadership: Youth participation builds skills in science, governance, and cooperation, creating a new generation of environmental leaders and "Black Sea ambassadors."
- Stronger engagement and motivation: Structured mechanisms (youth councils, incentives, exchange programmes) increase motivation, reduce disengagement, and foster stewardship.
- Cross-border cooperation: Youth-led networks and exchanges strengthen regional dialogue and cooperation across Black Sea countries.

In essence, partners position youth participation as a core driver of effective governance, innovation, and long-term protection of the Black Sea—not as a complementary or optional element.

The path forward

- EU Member States need to increase the ambition and speed of their actions to meet environmental goals.
- Implementing additional measures based on gap analyses is crucial to address persistent challenges.
- A higher level of investment is required to effectively implement the necessary programmes of measures.
- Better governance mechanisms are needed to ensure that measures are coordinated and effective.